FS-1 Closure Plan
Outstanding Issue Identification
May 20, 2015

Note: These issues are identified from the closure plan version kindly shared with EPA by Deb Alexander on 5/20/2015. EPA understands that this version is what Ecology intends to propose for public comment.

1) Text in Section H-A3.9.5, "Sampling Design," states:

> The decision rule for demonstrating compliance with the MTCA (WAC 173-340) Method B clean closure level has three parts:
>
> - The 95 percent upper confidence limit on the true data mean must be less than the MTCA (WAC 173-340) Method B clean closure level.
> - No sample concentration can be more than twice the cleanup level.
> - Less than 10 percent of the samples can exceed the cleanup level.

As discussed on several occasions with Ecology, EPA believes that use of a measure of the true data mean for comparison to the closure performance standard is not appropriate for demonstrating closure by removal or decontamination, and is inconsistent with both Ecology's dangerous waste regulations and clean closure guidance (Publication 94-111). More specifically, WAC 173-303-610(2)(b) states:

> (b) Where the closure requirements …. call for the removal or decontamination of dangerous waste, waste residues, …, then such removal or decontamination must assure that the levels of dangerous waste or dangerous waste constituents or residues do not exceed:"

None of the three bulleted elements of the closure decision rule for the FS-1 closure cited above meet the regulatory "do not exceed" standard. Therefore, the cited language does not ensure compliance with WAC 173-303-610(2)(b).

To resolve this issue, the closure plan may propose to use either a direct comparison "not to exceed" standard (the sampling data are directly compared to the closure performance standard) or an upper tolerance interval test applied. A tolerance interval is a statistical interval within which, with some specified level of confidence, a specified proportion of a sampled population falls. For example, the upper tolerance interval value would be that level below which, with 95% confidence, 95% of the sampled population lies.

On a related note, it is confusing to use the phrase "the MTCA (WAC 173-340) Method B clean closure level." Clean closure levels for soils, groundwater, surface water and air are defined by WAC 173-303-610(2)(b)(i), albeit based on MTCA methodology. A more appropriate phrase is "dangerous waste clean closure level."

2) Text in Section H-A3.9.5 states:

> "For FS-1, data assumptions were largely based on information obtained from a grouping of similar waste sites with the same type of constituents. Parameters from the 200-MG-1 waste sites were approved by Ecology in the SAP (DOE/RL-2009-60, *Sampling and Analysis Plan for Selected 200-MG-1 Operable Unit Waste Sites*), evaluated, deemed

appropriate, and utilized for the input parameters for FS-1. VSP parameter inputs and the basis for those inputs are detailed in Table H-A-5."

Based on a brief review of Tables 1-1 and 1-2 in DOE/RL-2009-60, it is not at all clear what basis exists for concluding that the various MG-1 OU waste sites are similar to the FS-1 container storage unit. Generally, the MG-1OU waste sites consist of dump areas/landfills, liquid waste management areas such as sewers, cribs, ponds and ditches, and unplanned release sites. These sorts of waste sites do not, on the face of it, appear to be similar waste sites to the FS-1 container storage unit. Please explain why the VSP parameter inputs for these waste sites are in fact suitable for application to the FS-1 sampling design.

3) Table H-A-5 in Section H-A3.9.5 seems to suggest that the MARSSIM module in the Visual Sampling Plan software has been selected. MARSSIM is principally designed for, and typically applied to, evaluation of sites with respect to radiation/radionuclides, although EPA clearly acknowledges that MARSSIM can be applied to chemical constituents. That said, the MARSSIM module in the VSP package seems to allow only calculations based on comparison of a sample mean to a decision criteria, contrary to WAC 173-303-610(2)(b) requirements discussed in Comment 1 above. Thus, the RCRA module in the VSP package should be used = the RCRA module does allow for an upper tolerance interval approach, as recommended in Comment 1 above. EPA notes that when this module is used based on a non-parametric analysis, a confidence level of 95%, and based on 95% of the sample population being below the decision criteria, the required number of samples is calculated by VSP is 59. This value assumes a completeness level of 100%, meaning there is no "sampling overage" provided for.

4) The history of the FS-1 container storage area suggests that a conceptual site model based on contamination, if it exists, being in the form of hot spots. This is in contrast to the assumption that contamination is generally distributed across the study area, albeit according to a distribution that is not assumed to be normally distributed. Recommendations to address the case of closure of units characterized by hot spot contamination can be found in Section 7.2.3 of Ecology's clean closure guidance document 94-111. This guidance recommends the approach described by Gilbert (see 94-111 for the specific reference). EPA provided Ecology example calculations of the number of samples required using the Gilbert method for selected EPA CAFO SWOC closure units.

   Using the VSP RCRA package to calculate the number of samples to detect a hot spot the size of a standard waste box (B-25 box) within the FS-1 area with a 95% confidence level, 377 samples would be required.